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## Using the Internet for alcohol and drug prevention

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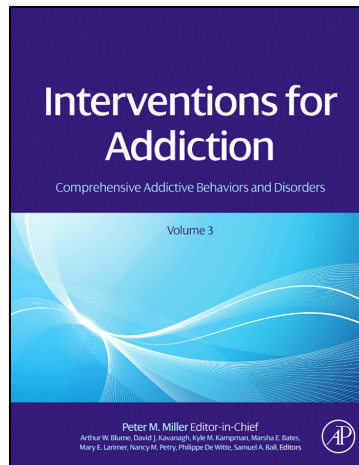
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# Using the Internet for Alcohol and Drug Prevention

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## INTRODUCTION

Problem drinking, in all its facets, lies at the heart of a major health and socioeconomic burden worldwide. Individuals whose alcohol consumption exceeds the accepted guidelines for low-risk drinking can be defined as problem drinkers. Various gradations of substance use disorders may underlie their alcohol consumption. (see Box 86.1 for an overview of specified alcohol use disorders, and see Alcohol Use Disorders and Symptoms and Course: Alcohol Use Disorder in Adulthood.)

Screening and brief intervention procedures (SBIs) have been found to be cost-effective in curbing adult problem drinking notably in primary care populations. Yet the number of problem drinkers reached by SBIs in primary care is very small (5–10%). This is due largely to a host of implementation barriers, including time, money, professional training constraints, and the fear of many general practitioners of confronting patients with their drinking habits. The uptake of SBIs by problem drinkers themselves is also low. Many feel shame and loss of privacy, and such perceptions inhibit them from seeking professional help. From a public

## BOX 86.1

## ALCOHOL USE DISORDERS

- Abstinence is defined as refraining from drinking alcoholic beverages.
- Moderate use is conceptualized as drinking less than 21 drinks per week for men and less than 14 drinks per week for women.
- Heavy use is defined as drinking levels in excess of 21 drinks per week for men and in excess of 14 drinks per week for women.
- Hazardous use [ICD-10 code Z72.1] is a pattern of heavy drinking and/or binge-drinking that carries with it a risk of harmful consequences to the drinker. These consequences may be detrimental to physical or mental health, or have adverse social consequences to the drinker or others. Other potential consequences include worsening of existing medical conditions or psychiatric illnesses, injuries caused to self or others, due to impaired judgment after drinking, high-risk sexual behavior while intoxicated, and worsening of personal or social interactions.
- Harmful drinking [ICD-10 code F10.1] is a pattern of drinking that is causing damage to health. The damage may be either physical (e.g. liver cirrhosis from chronic drinking) or mental (e.g. depressive episodes secondary to drinking). Harmful patterns of use are often criticized by others and are sometimes associated with adverse social consequences of various kinds. Harmful drinking has persisted for at least 1 month or has occurred repeatedly over the past 12-month period; subject does not meet criteria for alcohol dependence.
- Alcohol dependence [ICD-10 code F10.2] is determined if the drinker has at least three of the following: tolerance; withdrawal symptoms; impaired control; preoccupation with acquisition and/or use; persistent desire or unsuccessful efforts to quit; sustains social, occupational, or recreational disability; use continues despite adverse consequences.

Based on the publication by Saunders et al. (1993)

health perspective, then, the current impact of SBIs in the real world is limited. SBIs not only need to be effective in themselves, but large populations of problem drinkers would have to use them before the envisioned health and economic gains could be achieved.

Broad public access to the Internet has now opened new avenues to reach out to the large but yet uncontacted group of problem drinkers. One such opportunity involves Internet-delivered screening and brief intervention programs (ISBIs) aimed at curbing adult problem drinking and other substance use disorders. The availability of such ISBIs, especially those for problem drinking, has meanwhile expanded rapidly in many high-income nations, including the United States, Canada, Australia, and many Western European countries. These have both high levels of Internet penetration and a strong public health focus on problem drinking. This chapter discusses ISBIs designed for adult problem drinkers (see *Adolescent Substance Use: Symptoms and Course, Developmental Risk Taking and the Natural History of Alcohol and Drug Use among Youth, Screening and Assessment of Substance Use Disorders in Youth and Young Adults, Individual Prevention of College Student Alcohol Misuse and Substance Use Prevention Approaches for School-aged Youth for young people*). For the prevention of illicit drug use, our chapter deals with ISBIs for both adults and adolescents.

### INTERNET-BASED SCREENING AND BRIEF INTERVENTION RESOURCES FOR ADULT PROBLEM DRINKING

Screening and brief intervention procedures (SBIs) are available in different modalities, including face-to-face encounters between a health professional and an individual or a group of problem drinkers. These procedures can also be delivered by telephone or mail. More recently, screening and brief intervention programs have been provided by the Internet on PCs or smart phones. Like the more conventional SBIs, these ISBIs target adolescent and adult individuals that consume alcohol. Such groups may also be targeted via specific environments, such as school, community, workplace, or primary care settings.

#### Universal, Selective, and Indicated ISBIs

The various ISBIs may be distinguished into universal, selective, and indicated interventions, in accordance with Marzek and Haggerty's classification of prevention strategies from 1994. *Universal* ISBIs are designed to inform everyone in a particular population (such as a school or community); in relation to alcohol, this implies all individuals, regardless of whether and how much they consume. National alcohol awareness campaigns providing links to

online resources are examples of universal prevention strategies (see, for instance, the US site <http://www.samhsa.gov/>). *Selective* ISBIs target subgroups of specific populations that are at additional risk for problem alcohol use. Web-based self-help interventions designed for pregnant women in the community would be an example of selective ISBIs, given the greater health risks of alcohol to both mother and baby. *Indicated* ISBIs are focused on people who already drink alcohol in amounts that exceed the recommendations for low-risk drinking, but who do not have a clinical diagnosis of alcohol abuse or dependence (such as from *DSM-IV*). Examples of indicated prevention for problem drinkers are the Dutch ISBI entitled *MinderDrinken* and the Canadian *Drinker's Check-Up* (DCU), both of which are designed to help problem drinkers curb their alcohol use and diminish alcohol-related problems.

### Minimal and Extended ISBIs

ISBIs are available in minimal and more extended formats. *Personalized normative feedback* (PNF) interventions consist of screening and self-help, often in a single session. Participants receive personalized feedback based on their personal alcohol consumption as compared to recommended guidelines for low-risk drinking. Often this includes normative feedback, whereby problem drinkers compare their own drinking patterns (in terms of frequency, quantity, or other measures) to those in their peer group. One purpose of PNF interventions is to correct misperceptions that problem drinkers often have about low-risk drinking guidelines or about drinking prevalences among their peers. More extended forms of ISBI include *protocol-driven self-help treatments* based on principles of behavioral self-control, cognitive-behavioral therapy (CBT), motivational interviewing, or a combination (see *Motivational Enhancement Approaches, Cognitive Behavioral Therapies, Twelve-Step Facilitation Therapy, Contingency Management* for a detailed description of treatment principles). Self-help refers here to a type of psychological treatment in which participants work through the procedure more or less independently. Although the exact components may differ for each intervention, most contain several common elements. These include (1) self-assessments of alcohol consumption patterns, (2) psychoeducation on cognitive and behavioral change strategies, (3) goal setting for alcohol moderation or abstinence, (4) self-monitoring of daily alcohol consumption, (5) strategies to maintain alcohol reduction patterns, and (6) relapse prevention techniques. ISBIs often also make use of online, moderated peer-to-peer discussion groups. The recommended duration of use for extended ISBIs is 4–6 weeks, a time frame in which positive behavioral changes in problem drinking are expected to occur.

### Unguided and Guided ISBIs

Online prevention and treatment for problem drinking can be delivered with different amounts of support from health professionals. At one end of the continuum we find *online self-help interventions without professional guidance*. Unguided ISBIs are currently being delivered on a broad scale in routine alcohol prevention practice. At the other end of the scale there are *therapist-guided online therapies* consisting of multiple sessions and self-help exercises. The guidance may take place in asynchronous web-based communication (e.g. e-mail exchanges) or in real time through web-based chat sessions. Such guided online treatment is only available on a very small scale as of yet, for example, in the Netherlands. ISBIs with more limited guidance by coaches or therapists have scarcely been implemented for adult problem drinking, in contrast to their use for disorders such as depression and anxiety. ISBIs may also be used as a component of face-to-face SBIs or more intensive treatment (as a partial replacement or as an adjunct), in order to expedite the therapeutic process, improve its quality, and/or reduce costs. Guided ISBIs can be provided by different types of certified professionals (GPs, counselors, psychotherapists, substance use prevention workers), depending on the nature and intensity of the desired therapy and the prevailing legal requirements.

## PROS AND CONS OF ISBIs

Screening and brief interventions delivered over the Internet have a number of advantages over other modes of SBI delivery (face-to-face, postal, or telephone). Advantages involve user acceptability, aspects of service delivery such as cost savings and intervention quality, and research optimization.

### User Acceptability

ISBIs can potentially reach broad groups of problem drinkers without regard to geographical distance or time (24/7). Participants can work with the programs in their own time, at their own speed, and often free of charge. They can perform them in virtual anonymity, allaying fears of stigmatization and privacy violation. The high level of privacy may help persuade large groups of problem drinkers to work on their alcohol problems, something they might not have done in a more traditional SBI.

### Intervention Qualities

Timely accessibility is not only an important feature from the standpoint of participant convenience, but it



serves a therapeutic goal as well. Help-seeking behavior and motivation to change are often fleeting in nature. In many cases, an actual decision to seek help is a consequence of unforeseen situations, adverse effects of alcohol use, or both. Giving problem drinkers access to help at the right moment may therefore strengthen their motivation and thereby their likelihood of successful change. ISBIs make this timely access possible. Other qualities of ISBIs relate to the delivery of the intervention as intended. Treatment fidelity is high for ISBIs, owing to the protocol-based, structured, and automatic features that minimize delivery differences. ISBIs can provide immediate automated feedback on self-reported information. They can automatically monitor and report on participants' progress, both to the participants themselves and (in guided treatment) to the facilitating professionals. The Internet also facilitates various options that may heighten the appeal of ISBIs to participants, such as graphic, audio, and video features to complement text-based components.

### Service Delivery and Research

Although the costs of developing ISBIs may be considerable, most programs, especially those without guidance, offer cost benefits, as they can be delivered to large numbers of problem drinkers at a low marginal cost per additional user. Even if they provide therapist support, ISBIs still may save time for both therapists and participants when delivered as stand-alone interventions or as components of face-to-face therapies (e.g. by reducing the number of sessions needed). Other features that increase the economic attractiveness of ISBIs include shortened waiting lists and saved traveling time. ISBIs also greatly simplify the process of effectiveness research, as both participant recruitment and data collection can be carried out automatically through the Internet.

### Disadvantages

Some of the current disadvantages of ISBIs are likely to be overcome through future research and practice. Web-based interventions may not be suitable for all problem drinkers, such as those that are computer illiterate or have low reading levels. Others may find online help disagreeable or inconvenient, whether it is with or without professional support. For yet another group, the complexity of the alcohol problems may preclude treatment with ISBI, and more intensive or inpatient treatment may be required. Some coaches or therapists may also not possess the specific skills needed for giving online therapy.

### AVAILABILITY, ACCEPTABILITY, AND USER PROFILES OF ISBIs

Internet-delivered SBIs have grown rapidly in number, particularly in the United States, Canada, Australia, and in European countries such as the United Kingdom, Finland, Sweden, and the Netherlands. Since 2000, process evaluation studies have reported on the availability, user acceptability, and user profiles of (mainly unguided) ISBIs for adult problem drinkers in the general population. These studies afford ample evidence that a sizable adult population seeks web-based help for problem drinking and is satisfied with that type of intervention. To illustrate, it is not uncommon for an ISBI to reach 10 000 participants within a very short time. Such successful outreach has never been achieved with conventional modes of SBI delivery. These numbers should not only be compared to the reach of the usual prevention or treatment strategies but also to the potentials of the various modes to reach the overall intended group. A conservative estimate in 2009 found that a single low-cost, unguided self-help intervention could reach around 2.5% of the target group, even without active recruitment. This is high, as the overall percentage of this population of problem drinkers reached by health care services is only 5–10%.

ISBIs generally appear to attract similar groups of problem drinkers in terms of sociodemographic profiles and severity of alcohol use. The majority of adult participants belong to the 35- to 55-age group. They are relatively more likely to be female, with an ISBI gender participation ratio of 1:1, as compared to a male–female ratio of 4:1 in problem drinking prevalence in many Western societies. In comparison to the general population, ISBI participants have relatively high educations, high incomes, and stable relationships. Those who actively take part in ISBIs, and especially in the extended self-help interventions after screening, drink well above the guidelines for low-risk alcohol consumption, having a mean weekly alcohol consumption from 30 to 50 standard units (of 10 g of ethanol). Their mean scores of 18–22 on the Alcohol Use Disorder Identification Test (>8 AUDIT) reveal a strong likelihood of alcohol abuse or dependence (*see* Alcohol Use Disorders and Internet Screening and Intervention Programs). Most participants are first-time-help seekers and are usually self-referred. Hence, ISBIs for problem drinkers indeed appear to address an unmet public health need.

### ARE ISBIs EFFECTIVE IN CURBING ADULT PROBLEM DRINKING?

A limited number of randomized controlled trials have assessed the effects of ISBIs in reducing alcohol

consumption among participants. For unguided self-help in comparison to nonintervention, available evidence from meta-analyses suggests small- to medium-effect sizes (Cohen's  $d = 0.40$ ) for alcohol reduction up to nine months postintervention (for an explanation of effect sizes and Cohen's  $d$ , see Evidence-Based Treatment). These results translate to a very favorable number needed to treat (NNT) of 5, indicating that about five drinkers must receive an ISBI to generate one positive intervention response. A fading of effect size differences in the longer term (12 months or more) has been observed, but more studies are needed to verify it. Even so, within-group differences still indicate that a substantial group of problem drinkers are consuming less alcohol at follow-up than at baseline. The small- to medium-effect sizes for unguided ISBIs compare well with those reported for face-to-face adult brief interventions in primary care and for unguided postal self-help.

Extended unguided self-help ISBIs show a medium impact in meta-analyses ( $d = 0.60$ ), greater than that of minimal PNF-based unguided ISBIs, which have effect sizes in the small range. Such findings were not confirmed, however, in a large-scale randomized controlled trial ( $N = 7935$ ) published in 2011. It found no significant difference in terms of alcohol reduction between a group receiving minimal psychoeducational information only and a group receiving an extended self-help ISBI procedure at any of the three assessments (at 1, 3, and 12 months). Both groups decreased their mean weekly alcohol consumption by 20 units (from 46 to 26), thus suggesting potential benefit from access to either minimal or more extended ISBIs. Differences in findings compared to other studies might possibly be attributable to differing study designs. One striking difference involves the blinding of participants to their group allocation. In most studies on unguided ISBIs, researchers inform participants to which group they will be assigned as they inform them about study aims during recruitment. Nondisclosure of group allocation is preferable, as such knowledge may influence treatment outcomes and bias results.

The effectiveness of Internet-based multiple-session therapist-guided self-help treatment has also been assessed in two studies in comparison with nonintervention. One of these found a medium effect ( $d = 0.59$ ) for chat-based therapy, and the other found a large effect ( $d = 1.21$ ) for asynchronous e-mail therapy in terms of weekly alcohol consumption and conformity with low-risk guidelines at 3 months after the start of treatment. Such outcomes may be initial evidence for a potentially stronger impact of guided self-help treatments as opposed to unguided ones. A 2011 study found that although unguided self-help was as effective as guided chat-based treatment at 3 months, the chat-based group fared better at 6 months in terms of a further reduction in mean weekly consumption. The medium to large effects

found for guided online treatment are similar to those found in meta-analyses for face-to-face treatments ( $d = 0.80$ ). More research is still needed to try to replicate findings that compare guided online treatment to unguided online interventions in terms of alcohol consumption and related outcomes.

### ISBIs for Problem Drinking at the Workplace

Work environments seem to be promising venues to deliver screening and brief intervention, as they potentially afford easy access to large groups of problem drinkers. It is this large population of problem drinkers in employment that is responsible for the bulk of the health and economic burden associated with alcohol misuse. Only a few studies have assessed the user acceptability or the effectiveness of workplace interventions; their outcomes are not overwhelmingly positive. One explanation for the disappointing results lies in the low percentage of employees who are willing to participate. They may fear loss of privacy or other negative consequences if they disclose themselves as problem drinkers at their place of work. ISBIs could help to overcome some of their fears, as confidentiality can be much better safeguarded in ISBIs than in conventional SBIs. When ISBIs are delivered via the workplace (mainly done up to now in large US or Australian companies), they are often components of overall employee health programs. Such ISBIs target the general employee population with preventive messages and with screening for problem drinkers and at-risk employees. Not surprisingly, such ISBIs are particularly effective for problem drinkers, delivering small to medium effects in terms of reduced alcohol consumption. Yet studies on ISBIs at the workplace are hampered by constraints similar to those affecting conventional SBIs, including limited sample sizes due to recruitment difficulties. Like conventional SBIs, ISBIs appear more acceptable to employees in work settings where alcohol use is strictly regulated, such as in the military. One study has illustrated the positive impact of two ISBIs among military personnel: Alcohol Savvy, a universal, primary prevention program aimed at adults in the workplace; and the PNF-based Drinker's Check-Up. The latter was found more effective than Alcohol Savvy, and both were superior to nonintervention.

## SUMMARY, FUTURE DIRECTIONS, AND CONCLUSIONS

### Summary

Internet-based screening and brief intervention programs (ISBIs) are effective, feasible, and acceptable

for delivery to many problem drinkers in the general population. The majority of people who actively use ISBIs drink well above the recommended guidelines for low-risk drinking. Most are adults between 35 and 55 years of age, relatively well educated, and in paid employment; most are first-time help seekers. Overall, ISBIs not guided by a professional have been found to produce small to medium effects compared to nonintervention. Studies of online guided treatment resources are scarce, but results suggest they may have a greater impact than unguided ISBIs. Whether the intensity of treatment will predict treatment outcomes and whether particular groups of problem drinkers will respond better to particular kinds of ISBIs needs to be examined further. The effectiveness of unguided ISBIs in reducing problem drinking is apparently comparable to that of face-to-face or telephone SBIs in primary care and of SBIs delivered by mail to adults in the community. The longer-term (more than 1 year) effectiveness of ISBIs has yet to be assessed. Differences between the outcomes of groups receiving unguided ISBIs and nonintervention control groups appear to narrow over time, though both groups tend to moderate their alcohol consumption.

Studies also show that a substantial percentage of ISBI participants do not succeed in reducing their alcohol intake. Even if they do, not all of them manage to stay below the low-risk guidelines. Yet even a reduction of one standard unit per person per day would generate substantial health and economic gains if large numbers of drinkers could be reached at low costs. Negative consequences of alcohol misuse, such as traffic accidents, injuries, and work absenteeism, could be diminished. Long-term detrimental health effects, such as cirrhosis of the liver, cardiovascular disease, major depression, and suicide, could also be mitigated. ISBIs could thus prove to be a viable component of an overall public health approach to problem drinking. That is especially true of ISBIs that require no professional guidance, as these can be disseminated on a wide scale with minimal investments of time and money.

## Future Directions

Evaluating and expanding the evidence base for ISBIs requires further research. The robustness of current insights needs to be tested, and many questions remain unanswered. Most findings are still not generalizable to the average problem drinker, based on the characteristics of existing ISBI participants. It is also unclear for which types of problem drinkers ISBIs might be more effective and in what settings ISBIs might be most successfully delivered. Improvements in study design and conduct should also make the results more generalizable to daily practice.

## *For Which Problem Drinkers Are ISBIs Effective?*

ISBI user profiles based on study participation data suggest that most users would have relatively high income and education levels. It is therefore not clear to what extent the outcomes of the currently available studies can be generalized to groups that are insufficiently reached at present, such as people of low socioeconomic status, the elderly, or ethnic minorities. Reaching such groups may require interventions with different formats or modalities as well as innovative recruitment strategies. Predictor studies that investigate whether low education or income is a barrier to successful engagement with ISBIs have yielded an incomplete picture, as have those that assess whether ISBIs might be less effective for very heavy drinkers than for moderately heavy ones (as has been found for offline SBIs). More research is therefore needed on these issues. Studies on mediators and moderators of behavioral change in problem drinking and on the most effective components of ISBIs might create more insights. Incorporating diagnostic interviews into randomized controlled trials of ISBI participants (in addition to the current self-report screening measures) could produce more in-depth knowledge about many of these issues and about the severity level of the individual drinking problem. Research on additional aspects of ISBIs, such as the possible role of natural recovery mechanisms and the potential adverse effects of unguided interventions (including the postponement of professional help), will further strengthen the ISBI evidence base.

## *Improving Treatment Compliance and Discouraging Dropout*

Most ISBI studies are hampered by high dropout rates and low intervention adherence by participants. Study dropout is often well over 40%, while as few as 15% of participants may actually complete the intervention as intended. Dropout rates of this magnitude may bias study outcomes even if missing data are accounted for statistically. Improving adherence and reducing sample attrition will enhance the validity of research results and decrease the likelihood of bias. Some studies have reported contradictory associations between the level of adherence and the severity of problem drinking: Some found that the more serious the problem, the greater the engagement of the participants; others found that study dropouts had significantly greater alcohol-related problems than completers. Other reasons for dropout or noncompliance could be that participants attain their goals early or are dissatisfied with the ISBI itself. Although one might understandably presume that low adherence means poorer treatment results in ISBIs (as has been shown for offline SBIs), any such relationship needs to be substantiated in research. These investigations, too, will contribute to the



evidence base for the rapidly growing field of Internet screening and brief intervention for problem drinking.

### ***Assessing the Cost-Effectiveness of ISBIs***

Several economic studies have evaluated the cost-effectiveness of brief face-to-face interventions for problem drinking, and most have found favorable benefit-to-cost ratios. Although comparable studies on ISBIs are very few in number, these, too, suggest promising economic outcomes in terms of both the low delivery costs of ISBIs and the indirect cost savings accruing from reduced production losses and improved job performance by problem drinkers. Further studies are required to investigate the economic implications of ISBIs more rigorously.

### **Conclusion**

Internet-based screening and brief intervention (ISBI) is a feasible and effective strategy to curb adult problem drinking. Its potential could be enhanced by integrating such online intervention resources into approaches that combine public health prevention strategies with treatment strategies in primary and secondary care. Such approaches could be based on a “stepped-care” model to address problem drinking. Unguided, free-access ISBIs would be a cost-effective first step. Problem drinkers might then move up to guided interventions, if necessary, or even to more intensive treatment and medication. Low-threshold monitoring of client progress is, however, a key requisite for successfully implementing a stepped approach. Monitoring would ensure that treatment for problem drinkers is stepped up in a timely and efficient manner. More intensive treatment might consist of guided ISBIs or face-to-face treatment modalities, or combinations of both. Adjunctive online peer support may enhance the effectiveness of ISBIs throughout all such stepped-care stages. Studies on the use of ISBIs by primary care providers or hospital emergency departments are still rare, and it is not yet known whether ISBIs could help overcome the general constraints of SBIs in such settings. Given their demonstrated advantages, we expect they may do just that. The study and implementation of ISBIs may therefore help to build a public health strategy that provides a full range of effective prevention and care services for problem drinkers in a cost-effective manner.

## **INTERNET INTERVENTIONS FOR ILLICIT DRUG USE**

This section reviews the literature on web-based interventions to assess the progress and the evidence regarding the effectiveness of Internet intervention for

illicit drug use and the misuse of licit (e.g. prescription or over-the-counter) drugs. The potential benefits of ISBI found for problem alcohol consumption are likely to extend to interventions for illicit drug use. Although this field lags behind the developments of ISBI for alcohol, there are still examples of universal, selective, and indicated programs that have been evaluated. Given the range of substances under investigation and the current stage of development, this section includes programs evaluated in both adult and adolescent settings.

A search for peer-reviewed papers on Internet interventions revealed reports of interventions that covered a wide range of target groups – from universal preventive approaches to those targeting people fulfilling DSM-IV criteria for substance use disorders. Most studies reported outcomes for several classes of drugs (often including alcohol and tobacco), but there were specific interventions for users of benzodiazepines, cannabis, cocaine, and opioids.

Interventions for illicit drug use have adopted a range of methodologies, including computer-generated letters and facilitated video conferencing, but generally they are used to deliver programs in a standard fashion to replicate the input from a therapist. These draw on a number of theoretical or treatment frameworks, including social learning theory, motivational interviewing, community reinforcement approach, family interactional approach, and CBT.

## **INTERVENTIONS FOR CANNABIS USE**

Cannabis is the most widely used illicit drug in the world with about 4% of the adult population having consumed cannabis in the last year. This compares about 1% for opiates, cocaine, and amphetamine-type stimulants combined with the prevalence in the developed world ranging from 0.1% in Japan to 16.8% in Canada. Unlike the interventions for alcohol, among the interventions that included cannabis use as an outcome, there were diverse theoretical approaches underpinning the programs. This diversity may reflect the age range of participants. First, as with alcohol, among adults, cognitive-behavior therapy and motivational approaches were used. Personalized feedback alone did not appear to be effective. Brief interventions that include incentives, produce short-term improvements, and extended intervention can be successful in reducing cannabis use to 12 months. Other interventions have involved mother and (teenage) daughter dyads, and via extended programs based on family interaction theory, these have achieved significant reductions in cannabis use to 24 months, plus reductions in measures of other substances. Further trials with extended interventions

include educational approaches, which show little effect and programs drawing on social influence and social learning theory that were successful in reducing cannabis consumption to 6 months.

## INTERVENTIONS AS ADJUNCTS TO PHARMACOTHERAPY

Opioid substitution therapy for heroin dependence with methadone or buprenorphine is well established. However, this requires the collection of medication on a (near) daily basis from a clinic or pharmacist. Attendance for psychotherapy would be an additional burden, especially as agonist therapies are meant to permit recipients to return to everyday activities, such as employment or education. The provision of Internet-based therapy would alleviate this burden while providing an additional support in the transition away from heroin dependence. However, initial research has only provided limited support for this proposition. Studies published in 2008 and 2009 by Bickel and Chopra found that contingency reinforcement for drug-free urine samples improved abstinence whether delivered by therapists or computers compared with standard care. A comparison of video conferencing with face-to-face care found no significant difference in outcomes, albeit with a small sample.

## LIMITATIONS OF EXISTING RESEARCH

These studies typically have had small samples, with the median being 120 participants. As a result, there has been little opportunity to evaluate the key characteristics of successful interventions or to identify whether there are critical features of those who would benefit most from face-to-face interventions or computer support. In addition, these interventions often use short-term outcomes, with the median follow-up being 6 months, ranging from as little as 2 weeks to 24 months. Although, most studies had rates of attrition that would be considered low for Internet interventions, these should be considered in light of the length of follow-up. Furthermore, some studies included incentives (such as medication or voucher contingency schemes) or were delivered in combination with methadone or buprenorphine maintenance programs. Nevertheless, retention of over 90% at 24 months, as reported for one German program, would be meritorious in any circumstance. Most studies used self-reported drug use, which is often used as an outcome measure in the substance use field. However, some of the studies, especially those including drug substitution programs, were able to

include "objective" measures such as urine screening tests to provide a more rigorous outcome.

## CONCLUSIONS

Internet interventions for substance use are still in their infancy, although the initial reports appear to be favorable. Characteristic of this stage is the diversity of approaches, even though these were typically underpinned by the notion of replicating existing face-to-face therapies. However, the development of interventions that use multiple features of web content (e.g. blogs, chat, games) and have the potential to create a new paradigm in treatment still seems to be problematic.

Concerns exist about the cognitive capacity of substance users to benefit from treatments such as CBT that require insight and complex cognitive tasks. The use of computer-aided treatment, particularly if it requires strong literacy skills or lacks the potential to clarify misunderstandings, could be a further barrier to effective treatment. Nevertheless, the potential for exercises to be repeated as required, progression at the participant's own pace, and the presentation of multiple vignettes modeling behavior could be beneficial compared to face-to-face interventions.

In sum, the breadth of target groups, ranging from universal prevention to those with dependence, suggests considerable utility of this approach. However, the universal prevention approach is the most likely to exploit the advantages of computerized interventions with greatly extended reach and fidelity compared with standard care. The ISBI approach can be successfully integrated into the school curriculum, but it remains to be seen whether this explicitly harm-minimization model will be acceptable in all jurisdictions, such as the United States, where abstinence models predominate.

Overall, the use of ISBI has yet to establish a strong empirical basis for its use as either a treatment or an adjunct to pharmacotherapy among illicit drug users. However, the potential benefits offered by this approach warrant further investigation, in particular its use in universal prevention (e.g. within the school curriculum) and as a means of engaging marginalized and stigmatized client groups, which are currently reluctant or unable to access conventional treatment.

## List of Abbreviations

<b>CBT</b>	cognitive-behavioral therapy
<b>ISBIs</b>	Internet-based Screening and Brief Interventions
<b>PNF</b>	personalized normative feedback
<b>SBI</b>	screening and brief intervention procedures

## Further Reading

- Riper, H., Spek, V., Boon, B., Conijn, B., Kramer, J., Martin-Abello, et al., 2011. Effectiveness of E-Self-help interventions for curbing adult problem drinking: a meta-analysis. *Journal of Medical Internet Research* 13 (2), e42.
- Riper, H., Kramer, J., Conijn, B., Smit, F., Schippers, G., Cuijpers, P., 2009. Translating effective web-based self-help for problem drinking into the real world. *Alcoholism-Clinical and Experimental Research* 33 (8), 1401–1408.
- Tait, R.J., Christensen, H., 2010, June 7. Internet-based interventions for young people with problematic substance use: a systematic review. *Medical Journal of Australia* 192 (Suppl. 11), S15–S21.

<http://www.downyourdrink.nl> – Down Your Drink.

<http://www.drinkerscheckup.com> – Drinkerscheckup is a program for problem drinkers including comprehensive assessment, objective feedback, and help with making a decision.

<http://www.jellinek.nl> – Jellinek Retreat offers exceptional care for those with addiction problems, burnout, or depression.

<http://www.minderdrinken.nl> – MinderDrinken is an interactive self-help intervention for problem drinkers, based on cognitive-behavioural and self-control principles.

## Relevant Websites

<http://www.alcoholdebaas.nl> – Alcoholdebaas.

<http://www.beacon.anu.edu.au> – Beacon is a portal that reviews online applications for mental and physical disorders.